



Charles Conrad, Jr.  
Commander



Richard F. Gordon, Jr.  
CM Pilot



Alan L. Bean  
LM Pilot

# ROUNDUP

NASA MANNED SPACECRAFT CENTER

HOUSTON, TEXAS



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## Launch day for Apollo 12

### ALSEP provides stepping stone to the planets

The ALSEP which astronauts Conrad and Bean will leave on the Moon has been called a stepping stone to scientific exploration of the planets. The knowledge gained from its experiments will contribute to the object of all planetary and sub-planetary investigations: to provide a sound basis for comparative study of the galaxy. It will have more immediate

applications, as well. Lunar exploration will enable us to (1) determine the Moon's environment, composition, & gross body properties, (2) utilize the unique characteristics of the Moon to establish observatories and laboratories for long-term scientific investigations, and (3) determine whether lunar resources could be used for extended lunar operations, future interplanetary explo-

ration, and terrestrial purposes.

Astronauts Conrad and Bean will place the first ALSEP on the Moon. It is composed of 5 electronic experiments: a Passive Seismic Experiment (PSE) to measure lunar quakes and study the physical properties of the Moon's interior; a Lunar Surface Magnetometer (LSM) to measure the magnetic fields of the Moon; (cont'd on page 4)

Today at 11:22am, EST, Apollo 12 is scheduled for liftoff from pad 39A at KSC. December 14th is the backup launch date.

The flight profile of Apollo 12 will have a higher inclination to the lunar equator and will leave the free-return trajectory at mid-course correction #2.

Non free-return means that it will be necessary to fire the spacecraft's on-board engines to effect re-entry to Earth atmosphere. Free-return lets the natural forces of gravitational attraction pull the CM into the re-entry corridor. Return to the free-return trajectory is always within the capability of the SPS or descent propulsion systems.

For the nightowls among us, here is the schedule of major events during the flight:

- \* Nov. 14:
  - 11:22 am EST Launch
  - 2:09 pm Translunar Injection

- \* Nov. 19:
  - 1:53 am Moon landing
  - 5:55 am First EVA
- \* Nov. 20:
  - 12:29 am Second EVA
  - 9:23 am LM liftoff
  - 5:18 pm LM ascent stage impact
- \* Nov. 21:
  - 3:43 pm Transearth Injection
- \* Nov. 24:
  - 3:57 pm Splashdown

Two artifacts will remain on the Moon to commemorate the Apollo 12 visit: an American flag, and a plaque on the LM bearing the date and the astronauts' signatures.

Apollo 12's stay on the Moon will last 31.5 hours. Astronauts Bean and Conrad will twice leave the LM, once to deploy the ALSEP, the second time to gather geologic samples and conduct experiments. Should they land near Surveyor III, they will photograph the craft and retrieve a number of items for inspection back on Earth. They will never be farther away from the LM than the distance which they could cover in one-half hour—the duration of their emergency oxygen and suit pressure supply.

They are expected to gather 30-60 pounds of surface material, and will painstakingly photograph the areas from which the rocks were removed.

HAPPY LANDINGS!

### Monday is NASA Day at the Museum

The Houston Museum of Natural Science will show off its new exhibit areas this Monday, the 17th, when NASA will be the center of attention.

The exhibit of space technology and hardware began November 12, and will continue for several months, but Monday has been especially designated as the day for NASA-MSC.

From 9 am until 5 pm the Museum will present exhibits and films, along with lectures and demonstrations of aeronautic principles, rocketry, and so forth, by the Space Science lecturers. (see story, page 2)

An actual air-to-ground audio telephone line will be featured, as will the MSC lunar sample exhibit.

NOTE: Due to the Museum display, the Lunar sample presently on display in the auditorium of building 1 will not be available at MSC from Nov. 17 through the 22nd. It will be back at MSC for open-house on the 23rd.

### Patience is a virtue



At least 10,000 visitors came to the first Sunday open house at MSC since the moon rock went on display. An estimated 3,000 of them stood in line for a close-up view of the rock. Many more caught a glimpse from afar.

### Silverstein: "it is perhaps best . . . if I bow out now."

After 40 years of service, Dr. Abe Silverstein, the man who named Mercury and Apollo and was a pioneer in shaping the nation's aeronautics and space program, has retired. The Director of NASA's Lewis Research Center stepped down, effective the first of this month.

He stated his reasons for stepping down simply: "As NASA engages in its second ten-year program, it may be important that the men whose decisions initiate the new long-range projects be available to complete them. Since

Research and Technology, NASA Headquarters.

A long-time member of the NACA, having joined in 1929 at Langley the organization which underlies NASA, Dr. Silverstein first helped design the Langley full-scale wind tunnel. He also headed aerodynamic research which led to increased high-speed performance of World War II combat aircraft. In 1942 he moved to the Lewis Laboratory with a nucleus of Langley personnel, where he organized and directed research in its new Altitude Wind Tunnel, the nation's first supersonic propulsion wind tunnel.

In 1949 he moved up to the directorship of research, and from thence to Associate Director of Lewis in 1952.

Later, in his position as Director of Space Flight Programs at Headquarters, he was with NASA at its formation, participating in many key government committees concerned with rocketry and astronautics, and directing a good portion of the US research on turbojet, ramjet, rocket, and nuclear-propulsion systems.

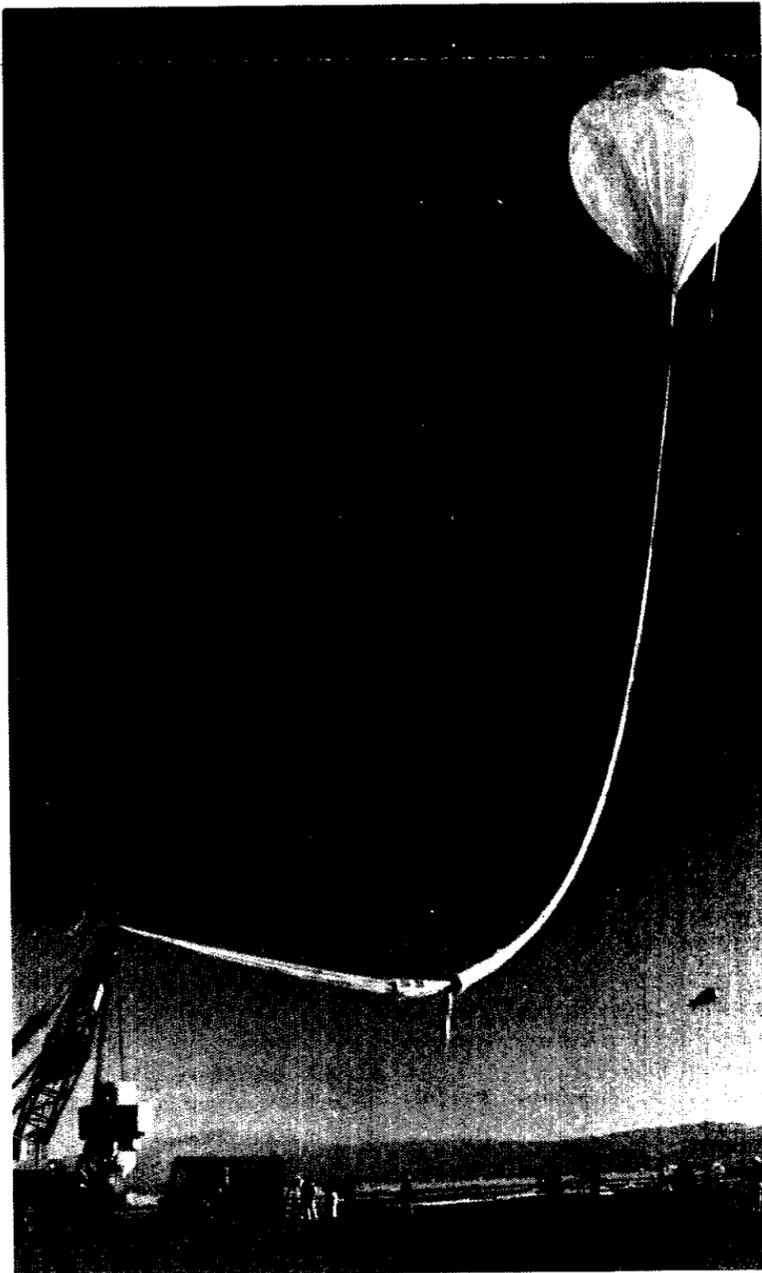
In 1961 he returned to Lewis, where he has served as Director until his retirement.



I do not think I can stretch my 40 years of service into 50, it is perhaps best for me and the Lewis Center if I bow out now."

Dr. Silverstein has been succeeded by Bruce T. Lundin, who was Acting Associate Administrator for the Office of Advanced

### Now that's what I call a balloon!



It's taller than the Washington monument. Has an interior volume greater than the Astrodome. Alas, it also had a leak. The balloon came down 3 hours after launch. The boys at the drawing board will try again, though. See description, pg. 2.

# "Spacemobile Man" brings space science to life

Have you ever been run into by a haystack? Thrown an egg out of a low-flying airplane without having it break? Have you ever launched your own rocket? These are all in a day's work for the 26 Space Science lecturers working for NASA as part of a contract with Oklahoma State University.

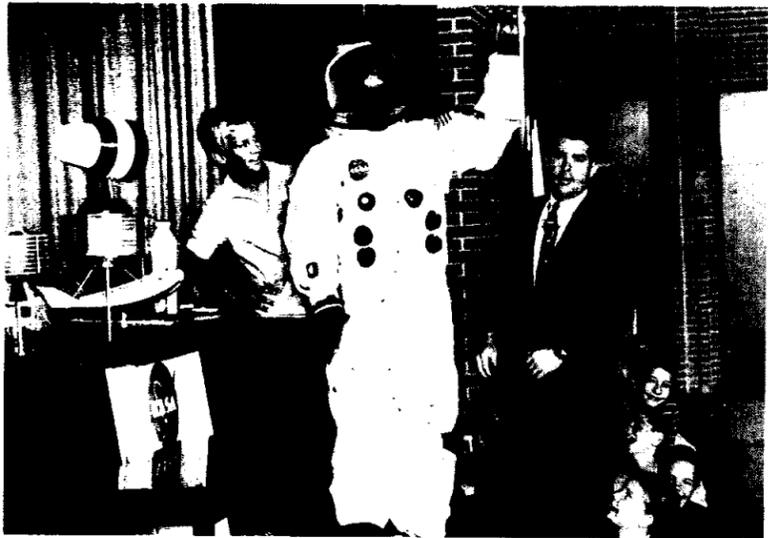
O.S.U. provides the men, who must be part truck driver, part teacher, part roustabout, and all enthusiasm.

A master's degree and 3-5 years of teaching experience are strict requirements for a Space Science lecturer. He speaks to an average of 60 audiences a month. One group may be composed of elementary school children; another, a group of science teachers who want to brush up on space science. He may also meet with civic, professional, and industrial organizations.

A typical lecture program lasts 60 minutes and includes discus-

sions and demonstrations of aeronautics, rocketry, propulsion systems, satellites, probes, orbits, communications, human factors, and manned spacecraft. Sometimes, especially with summer workshop groups, the students will construct experiments of their own. They may design containers which will absorb the force of impact of a falling object—such as that of the raw egg thrown from the airplane. When the package is opened there is no question as to whether the design was successful!

The Space Science series has been one approach to the requirement for a citizenry which is scientifically literate; an electorate knowledgeable in the advancing scientific and technological age. The lectures and demonstrations to students, and the summer workshops for their teachers, provide a "gap-filler" in an age when textbooks can not keep pace with all of the developments taking place. One science teacher admitted that last year she had shied away from the chapters on rocketry. This year her classroom was ringed with model rockets and demonstration models for various aspects of space physics. The catalyst? A



Look Ma! Space Science lecturer Jim Poindexter finds that the more active the student participation the more lively the program. This youngster can brag about being the first kid on the block to wear a real space suit.



Sisters at the College of Notre Dame learn about propulsion and aerodynamics, too. They built and launched their own models during this Aerospace Workshop.

*Dear Mr. Scarmagne,  
That was the first interesting long talk that wasn't real boring. I enjoyed it so much I only squirmed 15 times. I learned very much. Thank you very lot. I hope you come again and talk.*

*Sincerely  
Melissa Jones*

**From the heart**—little Melissa must have thoroughly enjoyed the lecture; remember how hard it was to sit still when you were 10?

summer workshop on space conducted by the Space Science lecturers.

Lecturers find that the young children are, predictably, more forthright in their enthusiasm than are the students in the higher grades. The presentations, teachers say, are the ones talked about longer, and with more enthusiasm than are any others.

The older high school students sometimes prefer to "maintain their cool". The parents and teachers, though, are right back sharing the excitement of the youngsters.

Speaking engagements are arranged through each state's Board of Education, which determines the schools to be visited. Then program coordinators try to arrange an itinerary which will allow the touring lecturer to establish a "home base" insofar as possible. He can then use this base as the hub for a number of speaking trips, and is free from "living out of a suitcase".

A second strategy is to travel

with the snowline. The lecturers operating in the 8-state area based at MSC begin lecturing in North Dakota, and keep heading south. Men such as Bob Jones, covering the Colorado Plateau area, though, can expect snow almost any time. The job then adds an additional requirement: mastery of the snow shovel.

The lecturers admit that even with their busy schedules, life can get a little lonesome. Thus, many of them bring their families along, camping and lecturing along their assigned circuits.

There are adventures along the road, too. In the Plains States you have to be on the lookout for hay stacks. The farmers just slip a forklift under the stacks and head back for the barn. The haystacks being as tall as they are, the farmer can't see what is ahead of him, so other drivers must keep on the alert. One lecturer, new to the area, didn't get out of the way in time. The accident report probably read: "truck hit by moving haystack".

## Lunar Module Team wins plaudits

It was Jim McDivitt to the Lunar Module Team the morning of October 15, when the famed astronaut, and now Manager of the Apollo Program officiated at the MSC Special Awards Ceremony at Bethpage.

Calling the lunar landing a remarkable accomplishment in view of the fact that only three Lunar Modules had previously been flown in space, McDivitt noted that lunar tasks will become increasingly difficult. He urged on all who are involved with future LM spacecraft to maintain the high standards of workmanship that have characterized the program.

RASPO Manager Andy Hobokan was present to read citations awarded by NASA, and McDivitt presented them to the recipients:

**Certificates of Commendation:**  
to Lew Fisher and Tony Licardi, RASPO Assistant Managers.  
**Superior Achievement Awards:**

to Al Jowid, Henry Carleton, Bob Zuckerman, Walt Gaylor, all RASPO Vehicle Management; Russ Clickner, Acting Chief, Test/SSE, Vehicle Support; Harry Briggs, Chief, Q.C., Vehicle

Support, RASPO.  
**Sustained Superior Performance:**

to Danny Mangieri, Test/SSSE, Vehicle Support; Walt Gaylor and Bill Andrews, Vehicle Management; Alex Kale, Q.C., Vehicle Support, all RASPO.  
**MSC Cost Reduction Achievement Certificate:**

to Art Reubens, Test/SSE, Vehicle Support, RASPO.

## CRISP will study cosmic radiation (see picture page 1)

The largest balloon ever built, 442 feet taller than the Washington Monument, enclosing a volume of 34-million cubic feet, was launched on Thursday, November 6. It is part of the Science and Applications Directorate project named CRISP — Cosmic Ray Ionization Spectrograph Program. The balloon was to have provided a stable high altitude platform for the 13,800 pound payload sent aloft to identify the various components of the cosmic radiation incidents upon the package and measure their energy.

The mammoth helium balloon is a two-part interconnected system with its balloon surmounted by a smaller launch balloon. Both balloons are made of laminated Mylar plastic film

with reinforcing Dacron fibers. 14½ acres of plastic film go into the making of the CRISP balloon and 37 miles of seals have been made to join its many balloon

panels.

The CRISP balloon system's 997 foot overall length at launch changes to a nearly spherical, 34-million cubic foot volume.

## AMPO gives service pins to five



The four certificates displayed above commemorate ten years of service for (left to right) Dennis Fielder, Patsy Green John Hodge, and Milton Goodhart, of the Advanced Missions Program Office. Thomas Milton, second from right, received his five-year pin.

## Super Achievement



James E. Hebert  
R. & Q. A. Office

## Ideas bring \$\$ to suggestors

Suggestions paid off for 21 NASA and military personnel last month. Awards, ranging from \$905 to \$15, were presented to the following MSC and military personnel:

**Captain Frederick R. Wentland** was awarded a check for \$905 for a suggestion to reduce photographically and reorganize mission documents such as flight plans, mission rules, etc. **Charles A. Biggs**: improving preventive maintenance procedures; **James R. Botsford**: installation of a printed circuit type fuse holder in computer as

protection against overloading and subsequent fire; **Jane M. Coward**: require duplicate packing slips; **Dorothy S. Davis**: simplify T&A form; **Joe L. Day**: replace existing wiring harness with a braided harness to eliminate wiring failures; **Wayne E. Etzel and Alpha L. Fisher, Jr.**: improved use of collating machine; **Alpha L. Fisher, Jr.**: replacement of manual switch with foot switch on jogger machine; **Alfred J. Lancki**: design and installation of a bearing having essentially zero friction, for the "pogo" training device; **Paul M. Marchal, Jr.**: change to higher-speed diazo print paper; **Frank A. Oliver**: attachment of a time-saving device for collator; **Thomas J. Richards**: imprinting multiple copy forms using addressograph multigraph machines; **Earle K. Smith**: cancel requirement for Data II bench maintenance equipment; **Mary L. Sprake**: decals for MSC equipment; **Herbert L. Tash**: centralization of document specifications and standards; **Donald K. Vaughn**: Use of page inserts to update MSC telephone directory.

Suggestion awards also went to **Melvin A. Blanken-**

## Don't believe it!

Fad diets are of dubious value insofar as changing long-term eating patterns is concerned. They may actually be deleterious in their effect. The MSC dispensary presents the following



**Second-largest award** went to **Earle K. Smith**, of R&QA, for his suggestion.

**ship, Kenneth F. Jansen, Hector M. Rodriques, Kenneth A. Sutton, and Kenneth E. Willett**, of Downey, and **Noel E. Woodwell**, at White Sands.

A Presidential Executive Order made it possible to reward military personnel detailed to NASA for their suggestions. Thus, Captain Wentland was able to receive his check, along with three other military men: Captains **Leeroy Huntington, Leonard L. Swank, and William J. Wetzel, Jr.**

list of fallacies which surround weight reduction:

- Obesity is due entirely to heredity.
- In the experience of some people all foods turn to fat.
- Meal skipping is a good way to lose weight.
- You can eat all you want and still lose weight if you take "reducing pills."
- Special low calorie bread should be used in reducing diets.
- Toast has fewer calories than bread.
- One must not drink water when trying to lose weight.
- Candy enriched with vitamins may be eaten when a person is reducing.
- Washing rice after cooking reduces calories.
- Sugar is not as fattening as starch.
- High protein foods and fruits have no calories.
- Gelatin dessert is nonfattening.
- Milk should not be included in a weight reduction diet.
- "De-starched" potato chips do not have calories.
- Meat burns its own calories.
- Margarine contains fewer calories than butter.
- For reducing, eat high protein foods for a week, then eat anything you want for a week.
- Grapefruit will reduce a person.

(courtesy National Dairy Council)

## "Pomp and Circumstance" for ten

The second group of graduates in MSC's apprentice program received their certificates of completion on October 30. The ceremony marked the completion of a four-year program of instruction and on-the-job training for eight of the men, a five-year program for the other two.

The program provides for two courses per semester at the University of Houston's College of Technology. Those showing outstanding potential may be selected for a fifth year in the program. Thus, upon graduation, the men have each taken 16-20 courses in math, electronic theory, or other courses related to their field. MSC pays their educational fees, salary, and provides for yearly promotions. By their fourth year in the program, they have attained the GS-7 level.

Selection into the program is by competitive examination.

This year's graduates were as follows:

- 4-year graduates: Allen R. Riley, Jerry D. Allen, Thomas E. Davis, Joseph M. Schmitt, Michael K. Woodcock, William S. Cowart, Charles A. Moore, and Graydon E. Owens.
- 5-year graduates: Donald M. Jordan and Clarence J. Fischer.

## Roundup Swap-Shop

(Deadline for Swap-Shop classified ad is the Thursday preceding Roundup publication date. Ads received after the deadline will be run in the next following issue. Ads are limited to MSC civil service employees and assigned military personnel. Maximum length is 15 words, including name, office code and home telephone number. Send ads in writing to Roundup Editor, AP3.)

### AUTOMOBILES

- 65 Belair SW, 9-seat, lug rack, air, fine running condition, clean, \$800, H. Granger, x5466  
68 VW sedan, radio, a/c, beige, J. Vyner, 483-3057.  
65 T-bird, automatic, air, AM/FM, all power, new polyglas tires, \$1500, R. Bazhaw, 534-2607 (Dickinson)  
Sale or trade for pickup; 1966 Mercury Monterey, 4-door hardtop, power, factory air, extra clean, \$1150, J. Clowdis, 471-2447.  
67 Corvette coupe, 427, air, power brakes and steering, 4-speed trans., positraction, maroon, 37,000 miles, owner, reasonable, 422-6367  
66 Catalina, new tires, good condition, J. Brown, 472-7960  
68 Firebird 400, automatic, air, power, console, radio, tach, mags, polyglas tires, excellent condition, M. Brovey, 932-2293  
67 GTO, clean, 23,000 miles, air, power, new tires, warranty, \$2300, Hoffman, x2901  
67 VW squareback, radio, clean, 23,000 miles, \$1400, D. Roundtree, 932-4740  
68 Corvette coupe, 4-speed, air, power steering, positraction, low mileage, one owner, Samonski, 877-4795  
68 Honda 350 Scrambler, good condition, good tires, \$95 cash, 471-0112 (LaPorte) after 6 pm.  
61 Oldsmobile Super 88, very clean, one owner, \$200, Lindemann, x 3371 or 877-1357 after 5 pm.  
55 Buick Special, 4-door, factory air, automatic, consider trade, \$135, 733-7667  
62 Chevy Belaire station wagon, 327, A/C TG, R/H, \$375, Bremant, 591-3885  
68 Pontiac Firebird convertible, air, automatic, good condition, \$1950, Scott, 591-2175  
65 Pontiac LeMans, factory air, automatic, PSPB, new tires, \$985, P. Coter, 487-3794 after 5 pm.  
67 Dodge sportsman domed camper, auto, air, sleeps 4, J. Rippey, 877-1859  
56 Chevrolet, 283, new tires, good paint, \$300, 877-2872  
Motorcycle: 1966 Bridgestone 17t cc, 3000 miles, good condition, \$300, Dick, 4751 or 944-4800.  
64 Thunderbird, grey, air, power, Fendell, x 2267

- 65 Cobra, AC, last 289 version, will not sell to dilettante; reasonably priced, Juday, 487-3946.  
65 Olds 442 Holiday, automatic, air, power, sports console, etc, good condition, \$1250, Cole, 591-4408  
65 VW bug, radio, heater, excellent condition, \$850, Streit, x2658 or 482-1559  
66 Mustang V8, automatic, factory air, power, loaded, excellent inside and out, one owner, Glines, x2267 or 944-9491 after 6 pm.  
67 Mustang 2+2, 390, 4 speed, air, GT kit, tinted glass, styled steel covers, Rainey, 474-2937 after 5 pm.  
Motorcycle: 67 Honda 160, like new, 3000 miles, extras, \$350, Holzaepfel, 427-1657 after 5.  
64 MGB, wire wheels, new convertible top, good condition, best offer takes it, Small, HU3-6203 or 591-2315  
67 Mercury Monterey, 2 dr h/t, air, power, tinted glass, low mileage, \$1,750, E. M. Smith, x4386 or 471-4328.  
66 Corvette convertible, 327, 4-speed, air, AM/FM disc brakes, positraction, mag wheels, heater, good tires, tach., owner; 66 Chevelle Malibu station wagon, 8 cyl., automatic, air, radio, heater, good tires, owner, 487-2047  
64 Pontiac Catalina, loaded, excellent condition, white w/turquoise interior, priced under book value, Franklin, 932-6057.  
68 Volkswagon, factory air, 13,000 miles, still in warranty, clean as new, \$1795, Sutton, 877-3028  
67 VW, radio, air conditioned, good condition, \$1190, Harris, x5548  
New cross-country minibike, 4hp, lights, \$200, McAdams, x 5381 or 488-3588  
**MISCELLANEOUS**  
Golf cart, electric, four 6-volt batteries, battery recharger, consider trade, \$120, 733-7667  
Jungle gym, playground quality, 6 1/2 feet high, 3/4" galvanized pipe, welded construction, \$25, Samonski, 877-4795  
Singer Slant Needle sewing machine, portable, with attachments, \$100, 471-1716  
Flintridge china, Miramar pattern (grey and rose), eight 5-piece place settings plus extras, worth \$248.80, make offer, 482-7877  
Discover the joy of open cockpit flying. Aerobatic instruction in the incomparable starman biplane, D. Grow, 944-9152

- 855-14 tires, tubeless "Generals", 2-ply (4-ply rating) white walls, excellent condition, best offer, D. Bell, x 3286  
Model T-1500 Wollensak hi-fi tape recorder, 7 1/2-3/4 ips, 7" takeup reel, minus cover, asking \$75, Christensen, 488-5619  
Adding machine, \$40, office typewriter, \$50, both in excellent condition, 649-2569  
Human hair wig, auburn, medium length, \$25, 643-7237  
Bike, girl's 24", J. Ripper, 877-1859  
TA-36 beam, HAM-M rotator, 50' rohn tower, all unused, \$225, Hamblett, 471-0348  
VW air-conditioner, presently installed and working in 1968 Karmann Ghia, \$75, x 4320, J. Shreffler.  
AR manual turntable, practically new, with Ortofon cueing device and Shure M-75E cartridge with new elliptical stylus, \$75, 488-3966  
VW trailer hitch with 1 1/2 ball to fit 56-67 sedan, \$12, C. Eldred, 471-4332.  
Lowrey organ, 2 full 44-note keyboards and 13-note pedal board, 5 years old, fine condition, \$900 new, sell for \$385, 472-2123.  
Golf clubs, full set Wilson Staff (pro line) woods, irons, like new, \$135, J. Stonesifer, 482-7643.  
Hoover tank-type vacuum cleaner with all attachments, one year old, \$30; Sears 20" rotary lawnmower, overhauled, new blade, \$15; Lawn-boy electric lawnmower with cable, less than 2 years old, \$30, D. Brown, 471-0066  
Tradewinds camp trailer (with fixtures), 14' aluminum boat, boat carrier racks, total: \$995, Durham, 944-8091 after 6 pm.  
Konica III 35 mm camera, F2 lens, coupled range finder with flash attachment and CdS light meter, all for \$30, Sampsel, 471-0172.  
Boy's 20" bicycle, good condition, \$8, D. Ward, 488-0715  
Gibson Les Paul guitar, Gretsch low-tension, also Vox 70-W Amp, tremolo and stand, \$175, Forbes 488-4238  
Wollensak 8 mm movie projector, excellent condition, \$40, Sears family exerciser, almost new, \$35, 944-2680.  
AM/FM radio for 68 Chevrolet, plus antenna, Boone, x 2538 or 944-0613 after 6.  
16 cubic foot refrigerator-freezer Frigidaire (GM) \$50, Haines, x 2681

- Whirlpool washer, runs well, \$45, Western Auto dishwasher, needs timer, good shape otherwise, \$15, Macnulty, x 4091 or 534-3792 (Dickinson)  
16' Snipe, mahogany deck, main and jib sails, big wheel trailer, new condition, \$1000; 90 h.p. gray marine inboard engine with transmission, needs a little work, make an offer; Holzaepfel, 427-1657 after 5.  
30-06 reloading dies, perfect condition, 100 rounds ammo, \$15; tricycles: 12 and 16", both very good condition, \$5 and \$7, Handley, 482-7041  
Set of weights, approx. 200 lbs, in good shape, \$20, Watson, 488-2477  
Sale or trade: Sears 23" b/w TV, excellent condition, 3 years old, \$50, or trade for portable, A. F. Smith, 488-3238  
32" Magnavox color TV, walnut cabinet, 1 year old, like new, priced to sell, \$350, E. M. Smith, x 4386 or 471-4328  
Lido 14, newer model with bow flotation, white, orange hull, all racing extras, excellent condition, best offer over \$1200, Mandell, 877-2925.  
21 1/2' leisuretime travel trailer, tandem, self-contained, sleeps 7, \$3200, Matties, 944-3586  
Coleman camping stove and folding table, never used, \$20, 487-3048.  
Go-kart, Montgomery Ward, bought last December, excellent condition, \$100, Smith, 877-1111.  
Sewing and alterations done, professional work, live on Park Place Blvd., Williams, 643-9128.  
2-wheel factory-built utility trailer & cover, 4'x8' with tilt bed, excellent condition, 1608 Second St., League City, 932-2996, Sanders.  
**PETS**  
Terrier-type puppies, need good home, great for children, \$5, N. Godeke, 645-0807 after 6 pm.  
AKC registered Basset hound, female, tri-colored, \$50, J. Cunningham, x 3803 or 488-1390.  
Black male Great Dane, registered, 200 lbs, 3 years old, attended obedience school, \$200, Mary, x4321  
Boston Terrier, male, AKC, champion sired, 1 year old, shots, wormed, \$50, 877-2872.

### REAL ESTATE

- 4-2-2 brick, lg. den, formal dining, central A/H, Sagemont, by owner, \$2,000 equity, \$21,950 total, 487-2614  
176 acres, air-conditioned cabin, fireplace, barn, 2 water wells, river frontage, East Texas Pines, R. Nickerson, 645-0372.  
3-2-2 Nassau Bay colonial, fenced, corner, formal living and dining, paneled den, fireplace, custom draped, carpeted, 5 1/4%, 591-2340.  
Room for rent—single male; residential home close to NASA, 877-4314, after 5.  
Rent: furnished house in Clear Lake Shores, 2 br., all heat and air-conditioned, fenced yard and nice furnishings, \$90 mo., 819 Hawthorne, Kemah, M19-1805 or M13-9738 after 6.  
**WANTED**  
Craftsman 10-inch radial arm saw in good condition, Hooper, 488-4120  
Two passengers to share expenses for private aircraft trip to St. Louis over Thanksgiving weekend. One way, 4 hours, J. H. Boynton, 946-1363  
Lost: At MSC picnic: one gold wrist watch with black leather strap, L. St Leger, GR3-2004.  
Ride home for about a month, Telephone & Park Place area, 7:30-4:00 N. Godeke, x4934  
Men's and women's 26" bicycles, will consider in any condition, L. Corcoran, 488-5331  
Fender "Echo-reverb" unit or other good brand of reverb, Bates, x 3816 or 944-4687  
Help in elementary statistics, one hour 2x weekly, \$3/hr, 488-2991.  
Rider to form car pool from Pasadena, Briar Cliff Apartments to bldg 4, 8:30-5, call 944-8241 after 5:30  
Clothes dryer in good condition, L. Williams, 643-9128  
**HOME FURNISHINGS**  
Beautiful pair carved spanish mirrors, \$40 for both or sell singly, 649-2569  
Matching Krohler Mr. & Mrs. curved back lounge chairs and ottomans, excellent condition, \$75 each, Blackshear, 946-8312  
Drexel server-buffet, traditional travis court group, V. Brand, 591-2592, \$50.  
Oak twin bed with trundle, mattresses, inner spring; matching dresser, student desk, \$149, Goshorn, 944-3948

## ALSEP stepping stone to the planets (cont'd from page 1)

a Solar Wind Spectrometer to measure the strength, velocity and directions of the medium energy electrons and protons which emanate from the Sun; and Lunar Ionosphere Detector (LID) and Lunar Atmosphere Detector (LAD) experiments (Also known as the Suprathermal Ion Detector Experiment (SIDE) and the Cold Cathode Gauge Experiment).

The Earth has its own magnetic field which protects it from the direct stream of solar wind charged particles and the solar magnetic flux. The Moon, however, has only a small or negligible magnetic field of its own. As a result the Moon is subject to forces of the solar wind, the solar magnetic field, and the Earth's magnetic field.

Four of the ALSEP experiments deal with the charged particles which emanate from the Sun, and the magnetic field which this "solar wind" carries from the Sun. By examining the effects on the Moon, much can also be learned about the physical properties of the Moon's surface and its interior.

Lunar composition will be approached by examining a variety of data: magnetic, seismic, and atmospheric.

The Lunar Surface Magnetometer will measure the magnetic field at the lunar surface. Since the electrical properties of the material which makes up the Moon determine what happens to the magnetic field, much can be learned about the composition of the Moon by studying the behavior of the magnetic field.



**Astronaut Bean demonstrates the ALSEP which he and Conrad will deploy on the Moon. The experiments are: Lunar Surface Magnetometer (left center foreground), Central Station (left rear, largest object) Solar Wind Spectrometer (center, smallest object) Suprathermal Ion Detector (center, larger white object). Passive Seismic Experiment (silver, cylinder-like object in center).**

Further information on the physical properties of the lunar crust and interior will be garnered by the Passive Seismic Experiment. The PSE will detect surface tilt produced by tidal deformations, moon quakes, and meteorite impacts. Seismic methods were selected to investigate the moon's internal structure and composition since this has proved the best such tool on the Earth.

The PSE will also detect vibrations on the lunar surface. It is expected that moonquakes and meteoroid impacts will be the two primary sources of vibrations. The PSE may turn out to be the best means of determining the numbers and sizes of meteoroids in space.

The LID and LAD experiments will pick up data on whether or not there exists a residual primordial lunar atmosphere on the Moon, and the extent of continuous and/or sporadic outgassing from the lunar surface, if this is still taking place. Some bonus information will be gathered when the Moon passes through the magnetic tail of the Earth — such information as the ion flux in the Earth's bow shock and magnetotail. LID will study the charged particles, LAD will measure the pressure of neutral particles.

It has been calculated that the solar wind puts one kiloton of energy into the Earth's magnetic field every second. This enormous amount of energy influences such Earth processes as the aurora, the ionosphere, and the weather. The Solar Wind Spectrometer will get data on the solar wind without virtually any of the interference which confronts Earth-bound scientists. It will measure the strength, velocity, and directions of the electrons and protons which emanate from the Sun. The data which it transmits will help in interpreting the magnetic field of the Moon, the lunar atmosphere, and the analysis of lunar samples. Its structure includes seven Faraday cup sensors, interconnected in such a way that a sequence of 186 measurements are completed in 28.1 seconds.

### Win A Bike

Now it's the younger set's turn to win at the MSC Credit Union. Two bicycles will be given away on December 17 to some lucky boy and girl member of the credit union.

Each new account opened for a child, and each deposit made to an already established account will mean another chance to win.

Encourage your children to start the saving habit early — the bicycle could be under their tree on Christmas morning.

## Your Job in Focus

### Line-of-duty injuries or illness

In order to be eligible for benefits under the Federal Employees Compensation Act, a written report of any injuries or illnesses which are work related should normally be made within 48 hours to the Occupational Medicine Branch, Building 8. Cases of latent disability should be reported as soon as the condition becomes apparent, if you have reason to believe that it is job related. Failure to report such injuries in a timely manner can jeopardize your right to benefits.

All injuries or disabilities should be reported, regardless of how minor they may appear at the time. Occupational Medicine Branch personnel will assist you in preparing the official report of injury or illness. Your supervisor should also be notified as soon as possible in the event of the job-related injury or illness.

There is no charge to leave for absence during the time required for examination, medical care, or hospitalization required on the date of the injury. Absences from the Center on succeeding days due to this injury, however, must be charged to available sick leave, annual leave, or approved leave-without-pay.

### "Use or lose" leave

Remember that Federal Leave Policy provides that annual leave can be accumulated to a maximum of 30 days (240 hours) which can be carried over from one leave year to the next. (Those employees having an excess of 30 days balance at the end of 1952 are permitted to carry over the balance for which they had credit on that date.) Annual leave balances in excess of the maximum will be lost as of the end of the leave year, January 10, 1970.

## SPAN keeps an eye on the sky

While the Apollo 12 mission is underway, scientists at ESSA's Space Disturbance Forecast Center in Boulder, Colorado, will keep watch on the sun. The Boulder Center is one of Seven ESSA, NASA, and Air Force solar observatories comprising a NASA Project called SPAN, for Solar Particle Alert Network. SPAN observatories are located in Houston, Boulder, the Canary Islands, Australia, Hawaii, and Iran. This global ring of observatories assures that the sun is under scientific observation 24 hours a day.

When solar flares — bright massive tongues of hot plasma — erupt from the burning mass of the sun, x-rays, radio waves, light waves, electron clouds, and destructive high-energy protons are sent toward the earth and into deep space. This year, solar activity is at a peak. Consequently, accurate forecasts and immediate warnings of solar weather are extremely important during man-

ned space flights.

Should a flare erupt, one of the seven SPAN stations sees it within eight minutes, the time it takes for light to travel from the sun to the earth. A tentative judgment is made of the magnitude and probable results of the flare. If the flare seems large enough to report, details of the disturbance are provided to the Mission Control Center at MSC.

If a dangerous solar flare should occur during an Apollo flight, the Mission Director, together with space physicists and the flight surgeon, would decide what evasive action to take. Since six to twelve hours would elapse before significant amounts of radiation could travel the 90-odd million miles between the sun and the moon, there is ample time to warn astronauts working on the lunar surface to take shelter in the landing vehicle or to return to the greater safety of the command module.

## ROUNDUP

NASA MANNED SPACECRAFT CENTER

HOUSTON, TEXAS



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 Editor ..... Sally LaMere  
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**Picnic chairman** Ogie McCommis presents prizes to the winners of the ticket-selling contest for last month's MSC picnic. From left, the winners are: Terry Wall, 1466 tickets, Marie Wilmeth, 704 tickets, and Joann Sanchez, 575 tickets. The park custodian estimated the crowd at Galveston Park at between 12 and 14,000 persons, making this the largest picnic, and the largest single attraction ever sponsored by the EAA.

## THE ASTRONUTS

courtesy of TRW's gordon a. south

